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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/556,808	11/15/2005	Arno Lange	280284US0PCT	1482
22850	7590	10/07/2008		
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER				
CHOI, LING SIU				
ART UNIT		PAPER NUMBER		
1796				
NOTIFICATION DATE		DELIVERY MODE		
10/07/2008		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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# Office Action Summary

**Application No.**

10/556,808

**Applicant(s)**

LANGE ET AL.

**Examiner**

Ling-Siu Choi

**Art Unit**

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-5 is/are rejected.
- 7) ☒ Claim(s) 2 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/ISD)
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date 01/04/2006

### DETAILED ACTION

1. This Office Action is in response to the Preliminary Amendment filed 11/15/2005. Claims 1-5 are now pending, which are drawn to a process to prepare a carboxyl-terminated polyisobutylene.

#### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1-5 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, line 5, formula (I) causes indefiniteness because it is not a polymer (polyisobutene). Should it read "A(M)<sub>n</sub>B?"

Claim 1 recites the limitation "heating the reaction mixture" in lines 15 and 17. There is insufficient antecedent basis for this limitation in the claim.

Claim1, lines 15 or 17, the recitation "the reaction **mixture** obtained" causes indefiniteness in view of claims 4-5. It appears that the reaction with ozone is carried out at from -100 to 40°C (claim 5) and the reaction product is heated to from 70 to 120°C (claim 4). Should it read "the reaction **product** obtained"?

**Claim Analysis**

4. Summary of Claim 1:

A process for preparing carboxyl-terminated polyisobutenes, comprising:	
	<p>reacting ozone with a polyisobutene which is terminated by an ethylenically unsaturated double bond and has a formula I</p> $A(M-B)_n \quad (I)$ <p>A = a radical derived from a polymerization initiator, M = a polymer chain comprising repeating units of the formula II</p> $[CH_2-C(CH_3)_2] \quad (II)$ <p>B is a radical of the formula III or IV</p> $-CH_2-CH=CH_2 \quad (III)$ $-CH=CR^1R^2 \quad (IV)$ <p>wherein <u>R<sup>1</sup> and R<sup>2</sup> are each H, C<sub>1-4</sub> alkyl or phenyl</u> and n is from 1 to 6, and</p>
(a) when B is a radical of the formula IV in which R <sup>1</sup> and R <sup>2</sup> are each phenyl, subsequently heating the reaction mixture obtained to from 60 to 150°C if appropriate;	
(b) in the other cases, subsequently heating the reaction mixture obtained to from 60 to 150°C	

**Claim Rejections - 35 USC § 102**

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

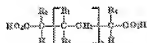
A person shall be entitled to a patent unless –

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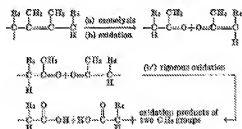
(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1 and 3-5 are rejected under 35 U.S.C. 102(b) based upon a public use or sale of the invention Nakagawa et al. (US 3,427,351).

Nakagawa et al. disclose a compound having the following formula:



$R^1$  and  $R^2$  being  $C_{1-10}$  alkyl groups;  $R_3$  and  $R_4$  being selected from the group consisting of hydrogen and lower alkyl groups and  $n$  is an integer from 4 to 250 inclusive, wherein the compound is obtained by the steps comprising (A) copolymerizing an isoalkene of the general formula of  $R_1R_2C=CH_2$  [ $R^1$  and  $R^2 = C_{1-10}$  alkyl groups] with an acyclic conjugated diene, the molar ratio of the copolymerized isoalkene to the copolymerized acyclic conjugated diene being 4 -250 /1, (B) cleaving the copolymer so produced at the double bonds by ozonolysis, (C) oxidizing the termine of the cleavage products to carboxylic acid groups,



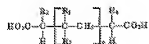
and (D) recovering the carboxy-terminated polymer so produced and wherein the monoolefin is isobutylene, wherein the reaction temperature does not exceed  $35^{\circ}\text{C}$  (col. 3, lines 19-66; col. 5, line 44; claims 1-7). Nakagawa et al. further disclose that

"[t]he dried solution is stripped of solvent by means of a rotating evaporator, and the product is freed of residual solvent by passage through a wiped film molecular still at a wall temperature of 100°C..."(col. 5, lines 51-55). Thus, the present claims are anticipated by the disclosure of Nakagawa et al.

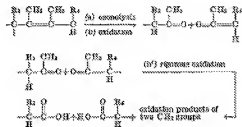
***Allowable Subject Matter***

7. Claim 2 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Nakagawa et al. (US 3,427,351) disclose a process to prepare a compound having the following formula:



$\text{R}^1$  and  $\text{R}^2$  being  $\text{C}_{1-10}$  alkyl groups;  $\text{R}_3$  and  $\text{R}_4$  being selected from the group consisting of hydrogen and lower alkyl groups and  $n$  is an integer from 4 to 250 inclusive, the process comprising (A) copolymerizing an isoalkene of the general formula of  $\text{R}_1\text{R}_2\text{C}=\text{CH}_2$  [ $\text{R}^1$  and  $\text{R}^2 = \text{C}_{1-10}$  alkyl groups] with an acyclic conjugated diene, the molar ratio of the copolymerized isoalkene to the copolymerized acyclic conjugated diene being 4 -250 /1, (B) cleaving the copolymer so produced at the double bonds by ozonolysis, (C) oxidizing the termine of the cleavage products to carboxylic acid groups,



and (D) recovering the carboxy-terminated polymer so produced and wherein the monoolefin is isobutylene, wherein the reaction temperature does not exceed 35°C (col. 3, lines 19-66; col. 5, line 44; claims 1-7). However, Nakagawa et al. do not teach or fairly suggest the claimed process, wherein the process comprises, in particular, the specific unsaturated terminine containing two phenyl groups.

## Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ling-Siu Choi whose telephone number is 571-272-1098. The examiner can normally be reached on Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Ling-Siu Choi/

Primary Examiner, Art Unit 1796

September 20, 2008